Clinical, Cosmetic and Investigational Dermatology

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ORIGINAL RESEARCH

Skin Quality – A Holistic 360° View: Consensus Results

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Introduction: Skin quality is an important component of human attractiveness. To date, there are no standardized criteria for good skin quality. To establish a consensus for good skin quality parameters and measurement and treatment options, a virtual skin quality advisory board consisting of a global panel of highly experienced aesthetic dermatologists/aesthetic physicians was convened.

Methods: A total of 10 dermatologists/aesthetic physicians served on the advisory board. A modified version of the Delphi method was used to arrive at consensus. Members accessed an online platform to review statements on skin quality criteria from their peers, including treatment and measurement options, and voted to indicate whether they agreed or disagreed. Statements that did not have agreement were modified and the members voted again. Consensus was defined as: strong consensus = greater than 95% agreement; consensus = 75% to 95% agreement; majority consent = 50% to 75% agreement; no consensus = less than 50% agreement.

Results: There was strong consensus that good skin quality is defined as healthy, youthful in appearance (appearing younger than a person's chronological age), undamaged skin and that skin quality can be described across all ethnicities by four emergent perceptual categories (EPCs): skin tone evenness, skin surface evenness, skin firmness, and skin glow. The EPCs can be affected by multiple tissue layers (ie, skin surface quality can stem from and be impacted by deep structures or tissues). This means that topical approaches may not be sufficient. Instead, improving skin quality EPCs can require a multilayer treatment strategy.

Conclusion: This global advisory board established strong consensus that skin quality can be described by four EPCs, which can help clinicians determine the appropriate treatment option(s) and the tissue or skin layer(s) to address. Skin quality is important to human health and wellbeing and patients' perception for the need for aesthetic treatment.

Keywords: aesthetic treatment, consensus, emergent perceptual skin quality categories, EPCs, skin quality

Introduction

Skin quality is important to human attractiveness[1,2] and it helps determine the need for and choice of aesthetic treatment.[3] Skin quality significantly influences perception of age, attractiveness, health and youth.[2,4,5] Even small changes in skin surface and pigmentation pattern can have a strong impact on perceived facial attractiveness.[2] This holds true across ethnicities and for both female and male faces.[6–8]

Age-related skin changes stem from aging-induced alterations that occur in all tissue layers. Skeletal aging leads primarily to a loss of bony support. This is visible

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as a decrease in volume, which decreases support and contributes to an aged appearance of the face.[9] The changes in bony support also alter the position of the true retaining ligaments. Aging of retaining ligaments and muscles leads to an expansion of facial spaces, which accentuates increased laxity and the appearance of volume loss.[10] Age-related changes in fat tissue in the face lead to volume loss and sagging.[11] The elasticity of skin decreases with age due to collagen and elastin loss[12,13] while there's an increase in surface roughness possibly due to decreased water and sebum content in the skin, which contributes to the development of skin rhytids, including but not limited to periorbital wrinkles (crow's feet) and forehead and glabellar lines.[14]

The age-related deterioration in viscoelastic properties are most pronounced after age 50 but insufficient skin hydration is more common in younger age groups, particularly between age 40 years to 50 years.[13,15] This creates the need for a multimodal and age-dependent treatment algorithm to enhance skin quality.

However, to date, there is no standardized criteria for skin quality.[16] To that end, a skin quality advisory board consisting of a global panel of dermatologists/aesthetic physicians was convened to establish a consensus for skin quality parameters, concepts, definitions, and measurement and treatment options.

Methods

The advisory board consisted of 10 dermatologists and aesthetic physicians from eight countries – Brazil, Germany, Israel, Malaysia, Republic of Korea, Russia, United Kingdom, and United States. Martina Kerscher and Kate Goldie co-chaired the advisory board. A modified version of the Delphi method was used to arrive at consensus.[17] The advisory board members began with a blinded question and answer round to establish a general understanding of skin quality. This was followed by an open discussion among the members. Advisory board members prepared video lectures on specific topics, including skin quality attributes, measurements, perception, and the skin microbiome. Members had an opportunity to view the recorded lectures on an online platform and were asked to review and comment on specific questions linked to each presentation.

From the discussions, statements and theses on skin quality criteria were extracted. Members accessed the online platform to review and refine the statements and voted to indicate whether they agreed or disagreed. If they disagreed, they were asked to explain why. Subsequent voting rounds were held. Statements that did not have agreement were rephrased or modified, and the members voted again.

Consensus was defined as: strong consensus = greater than 95% agreement; consensus = 75% to 95% agreement; majority consent = 50% to 75% agreement; no consensus = less than 50% agreement. Statements and recommendations had to have consensus or strong consensus to be considered for inclusion in this consensus report.

The advisory board held its meetings virtually due to the COVID-19 global pandemic and the risk of face-to-face meeting. The virtual meetings, which spanned 6 weeks, conferred several advantages over a conventional in-person meeting that typically lasts for only a few hours. For example, the advisory board members could have more in-depth discussions in the virtual format and respond to inquiries at their convenience. Members also had time to more deeply consider their responses and review presentations or relevant research that they otherwise would not have been able to in a live face-to-face meeting. In addition, participants submitted written responses, which helped ensure clarification and reduced the risk of misinterpretation.

This research did not involve human or animal subjects so institutional review board approval was not required.

Consensus Results/ Recommendations

Emergent Perceptual (Skin Quality) Categories

There was strong consensus that skin quality can be described across all ethnicities, age groups and gender by four emergent perceptual categories (EPCs) (Figure 1):

- Skin tone evenness
- Skin surface evenness
- Skin firmness
- Skin glow

Good skin quality is defined as skin that is healthy, undamaged, and youthful in appearance (appearing younger than a person's chronological age).

There was strong consensus that the EPCs are composed of individual parameters, each one associated with specific measurement methods and treatment options (Figures 2–5). The EPCs and their parameters are

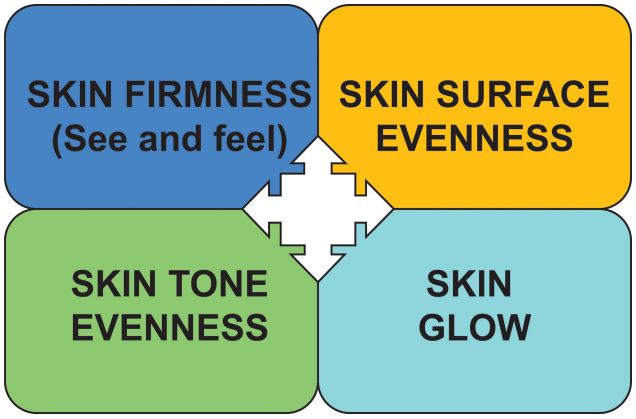

Figure 1 The four emergent perceptual skin quality categories (EPCs).

described in further detail in the following sections. See Supplementary Table 1 for a glossary of terms.

Skin Firmness

Firmness comprises all viscoelastic properties of the skin and underlying tissues. The individual parameters that constitute skin firmness are (Figure 2):

- Elasticity – The ability of the skin to return to its original position.
- Tautness/Tightness – The resistance of skin against mechanical force.
- Hydration – The water content of the epidermis.

Measurement methods and treatments to improve skin firmness vary depending on the targeted parameter as described below.

Elasticity

Measurement: The methods for measuring elasticity include a Cutometer (Courage + Khazaka, Cologne, Germany)[18] and/or a snap test.[19] The Cutometer is a validated option for measuring elasticity whereas the snap test can be useful for in-office assessment.

Treatment: Skin elasticity is mainly addressed with biostimulators, including calcium hydroxylapatite (CaHA; Radiesse®, Merz North America, Raleigh, NC, USA) – both diluted and hyperdiluted have been shown to have a biostimulating effect – and dermal/subdermal microinjections of hyaluronic acid (HA) with glycerol (cohesive polydensified matrix-HA + glycerol [CPM®-HA20G; Belotero® Revive, Merz Pharmaceuticals GmbH, Frankfurt, Germany]).[20,21] Areas that benefit the most from CaHA treatment include cheeks, neck, chest, inner arms, inner thighs, and hands.[22] Other treatment options for improving elasticity include microfocused ultrasound with visualization (MFU-V; Ultherapy®, Merz North America, Raleigh, NC, USA),[23,24] fractional laser,[25] deep peelings,[26] and topicals, such as retinoids.[27]

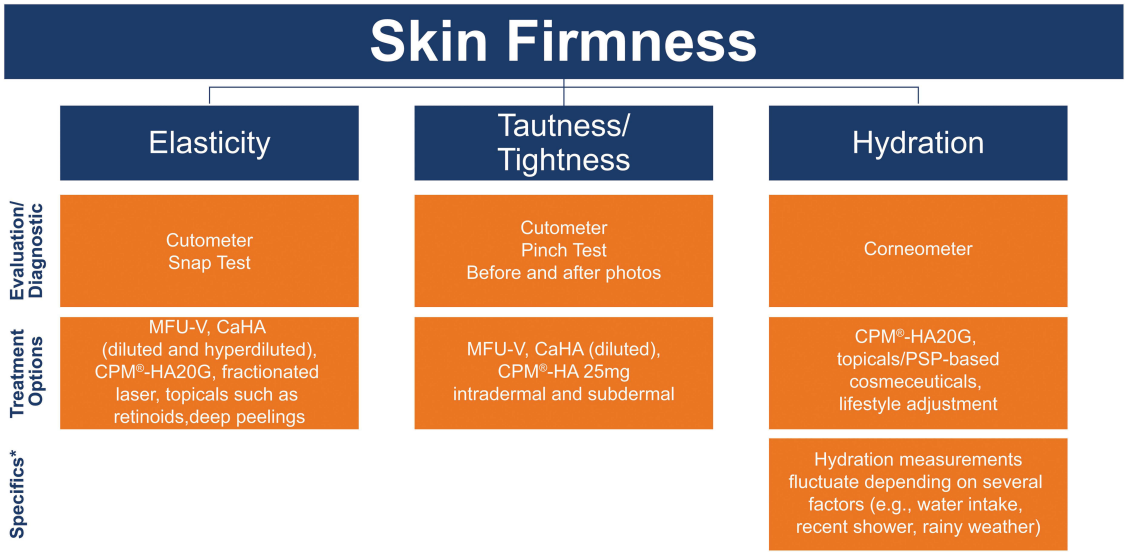

Figure 2 Skin firmness parameters, measurement methods, and treatment options.
Note: *Factors to consider specific to each EPC parameter where applicable.
Abbreviations: CaHA, calcium hydroxylapatite; CPM®-HA, cohesive polydensified matrix-hyaluronic acid; CPM®-HA20G, cohesive polydensified matrix-hyaluronic acid + glycerol; HA, hyaluronic acid; MFU-V, microfocused ultrasound with visualization.

Tautness/Tightness

Measurement: Tautness can be measured with a -Cutometer.[13,28–30] Other useful assessment methods include a pinch-test[19] and comparison of before and after photos.[31]

Treatment: The treatment options to improve tautness include MFU-V,[23] CaHA (diluted),[32] and CPM®-HA (25 mg, intradermal and subdermal).[20] MFU-V improves skin laxity, is safe in all skin types, and does not cause post-inflammatory hyperpigmentation (PIH).[33]

Hydration

Measurement: Hydration can be assessed with a Corneometer (Courage + Khazaka, Cologne, Germany).[34]

Treatment: Lifestyle adjustments, such as limiting sun exposure, avoiding excessive bathing, and regular use of moisturizers, may improve skin hydration.[35,36] Other treatment options are CPM®-HA20G and topicals/PSP-based cosmeceuticals.[20,37]

Skin Surface Evenness

There was strong consensus that skin surface evenness consists of six parameters (Figure 3):

- Pores – Visible, topographic feature of skin surface that are generally the enlarged opening of pilosebaceous follicles.
- Crepiness – Skin that is thin, wrinkled, similar in appearance to crepe paper. More common on arms, legs, neck, and under eyes.
- Wrinkles and lines – Lines in the skin caused by mechanical pressure, skin dehydration, or continuous muscle movement. Wrinkles and lines tend to appear earliest in Caucasians.
- Scars – Area of fibrous tissue that replaces normal skin after an injury. Acne scars are distinct from other scar types.
- Hair – No visible hair on the face.
- Clarity – Clear skin without black and white heads, pimples, and spots (red or brown rough age spots). Very important to young Asian women.

For measuring overall surface evenness, VISIA (Canfield Scientific, Parsippany, New Jersey, USA) is a good choice. Treatment options for improving surface evenness in general include botulinum toxin type A (BoNT-A), CaHA (diluted or hyperdiluted depending on the parameter being targeted as detailed below), CPM®-HA, and MFU-V.

Pores

Measurement: There is no validated tool for measurement of pore size, but one option is the LifeViz 3D imaging system (QuantifiCare S.A., Biot, France), which is currently used as a pore measurement tool.[38]

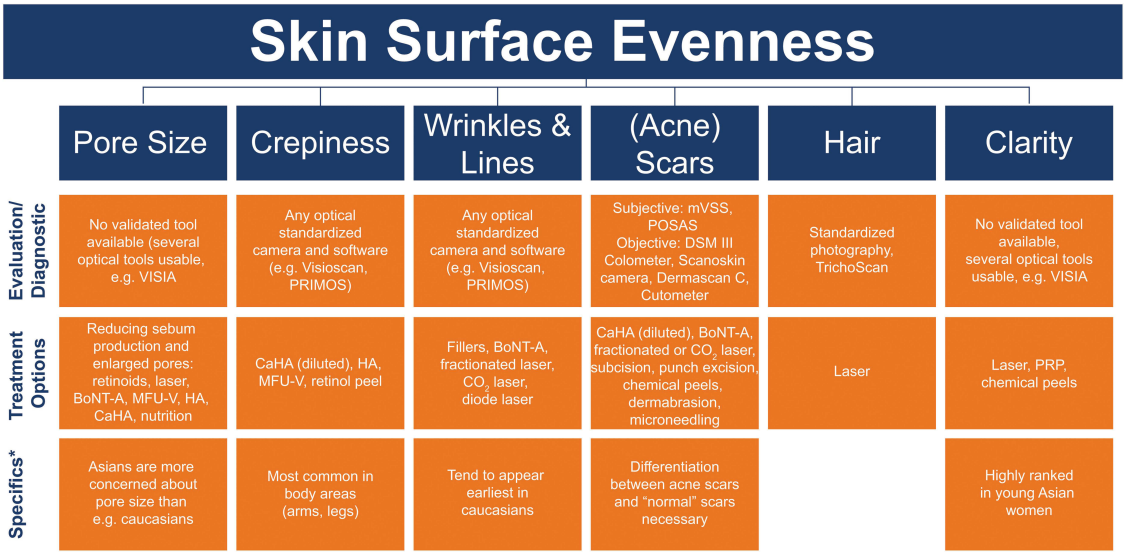

Figure 3 Skin surface evenness parameters, measurement methods, and treatment options.
Note: *Factors to consider specific to each EPC parameter where applicable.
Abbreviations: BoNT-A, botulinum toxin type A; CaHA, calcium hydroxylapatite; CO2, carbon dioxide; HA, hyaluronic acid; MFU-V, microfocused ultrasound with visualization; mVSS, Modified Vancouver Scar Scores; POSAS, Patient and Observer Scar Assessment Scale; PRIMOS, Phaseshift Rapid in vivo Measurement of Skin; PRP, platelet-rich plasma.

Treatment: BoNT-A, often used in a hyperdiluted form, can be useful for pore tightening in patients with increased sebum production, such as acne and rosacea.[39,40] HA can reduce pore size,[41,42] and hyperdiluted CaHA[43] can improve overall skin quality that encompasses pore size.

Crepiness

Measurement: An optical standardized camera and software, such as Visioscan (Courage + Khazaka Electronic, Cologne, Germany) and PRIMOS (Phaseshift Rapid In vivo Measurement Of Skin, LMI Technologies GmbH, Teltow/Berlin, Germany), can assess crepiness.[44]

Treatment: The treatment options for improving crepiness include CaHA (diluted),[22] HA, MFU-V,[45,46] retinol peel, lasers,[46] and deep peelings.[47,48]

Wrinkles and Lines

Measurement: Optical standardized camera and software, such as Visioscan and PRIMOS, can measure wrinkles and lines.[44,49]

Treatment: CaHA, HA, BoNT-A, fractionated laser, carbon dioxide (CO_2) laser, and diode laser can reduce wrinkles and lines.[50,51]

Scars

Measurement: Acne scars can be measured subjectively with Modified Vancouver Scar Scores (mVSS) or Patient and Observer Scar Assessment Scale (POSAS).[52,53] Objective measurement tools include DSM II Colormeter (Cortex Technology, Hadsund, Denmark [DSM III is the currently available model]),[54–56] Scanoskin camera (Leniomed Ltd, London, United Kingdom),[56] DermaScan C (Cortex Technology, Hadsund, Denmark),[55,56] and Cutometer.[55,56]

Treatment: Acne scars can be reduced by treatment with CaHA (diluted), BoNT-A (hyperdiluted), fractionated or CO_2 laser, subcision, punch excision, chemical peels, dermabrasion, and microneedling.[57]

Hair

Measurement: Hair density, diameter, and growth rate can be measured with TrichoScan (Tricholog GmbH, Freiburg, Germany),[58] included in TrichoScale AI (FotoFinder Systems GmbH, Bad Birnbach, Germany) and TrichoScan HD (DermoScan GmbH, Regensburg, Germany) systems, and standardized photography.

Treatment: The preferred treatment option for removing unwanted hair is laser.[59]

Clarity

Measurement: There is no validated measurement tool for clarity, but several optical tools, such as VISIA, can be used.[60,61]

Treatment: Laser,[62] platelet-rich plasma (PRP),[63,64] and chemical peels[65] can improve clarity.

Skin Tone Evenness

The parameters that make up this EPC include (Figure 4):

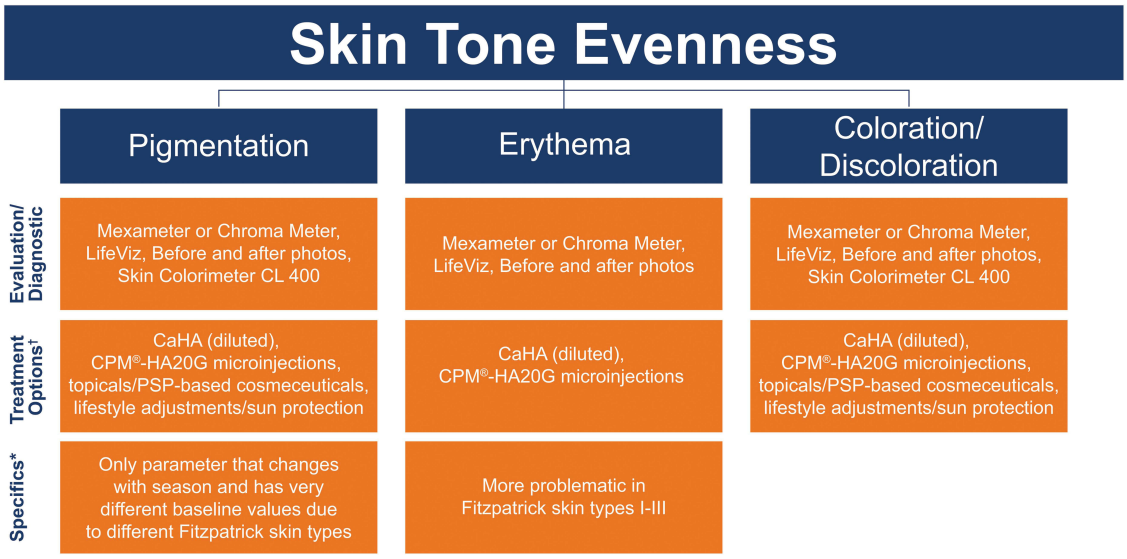

Figure 4 Skin tone evenness parameters, measurement methods, and treatment options.
Notes: *Factors to consider specific to each EPC parameter where applicable. †Both CaHA (diluted) and CPM®-HA20G indirectly improve skin tone evenness.
Abbreviations: CaHA, calcium hydroxylapatite; CPM®-HA20G, cohesive polydensified matrix-hyaluronic acid + glycerol; HA, hyaluronic acid.

- Pigmentation – Determined by distribution of melanosomes within melanocytes. Evenness is defined as uniformity in skin pigmentation and even distribution of pigments. Pigmentation issues, such as PIH, are more prominent in Fitzpatrick skin types IV–VI. This is the only parameter that changes by season and has very different baseline values that vary by Fitzpatrick skin type.
- Erythema – Redness due to increased blood flow. More prominent in Fitzpatrick skin types I–III.
- Coloration/Discoloration – Consensus on a definition for this term could not be reached (see Discussion section). However, the panel did agree that patients generally do not want to change their skin color, but rather want it to be more even in tone.

Pigmentation

Measurement: Mexameter (Courage + Khazaka, Cologne, Germany)[66,67] or Chroma Meter CR-400 (Konica Minolta, Ramsey, New Jersey, USA)[66,68] can measure pigmentation. Other options include LifeViz,[55] standardized before and after photos, and the Skin Colorimeter CL 400 (Courage + Khazaka, Cologne, Germany).[69]

Treatment: Treatments that can improve pigmentation include topicals/PSP-based cosmeceuticals (NEOCUTIS®, Merz North America, Raleigh, NC, USA),[70] and lifestyle adjustments, such as sun protection.[71] Lasers help with pigment[62] and are the second line therapy after topicals. CaHA (diluted) and CPM®-HA20G microinjections can improve undereye hyperpigmentation.[72]

Erythema

Measurement: Assessing erythema can be done with Mexameter, Chroma Meter, LifeViz, or standardized before and after photos.[73]

Treatment: CaHA (diluted)[43] and CPM®-HA20G microinjections[20] both indirectly improve skin tone evenness. Lasers can also improve skin tone evenness. BoNT-A has also been shown to enhance skin tone evenness.[74]

Coloration/Discoloration

Measurement: This parameter can be measured with Mexameter,[66,75] Chroma Meter,[66] LifeViz, standardized before and after photos, or Skin Colorimeter CL 400.[75]

Treatment: The treatment options are the same as for pigmentation and include CaHA (diluted),[43,72] CPM®-HA20G microinjections, topicals/PSP-based cosmeceuticals, lifestyle adjustments/sun protection.

Skin Glow

Skin glow is the only EPC that does not have individual parameters (Figure 5). However, it can be described by several synonyms, including radiance, luminosity, brightness, vibrancy, and complexion.

Measurement: Glow can be measured using a Mexameter, Glossymeter (Courage + Khazaka, Cologne, Germany), or clinical scoring system.[20]

Treatment: The recommended treatments to improve glow include HA or CPM®-HA20G,[20] CaHA,[43] MFU-V, BoNT-A, chemical peels,[65] and topicals/PSP-based cosmeceuticals.[70] Microinjections with HA can improve hydration and have biostimulatory properties, which improves glow.[20] Brightening after MFU-V is mainly due to the decrease of

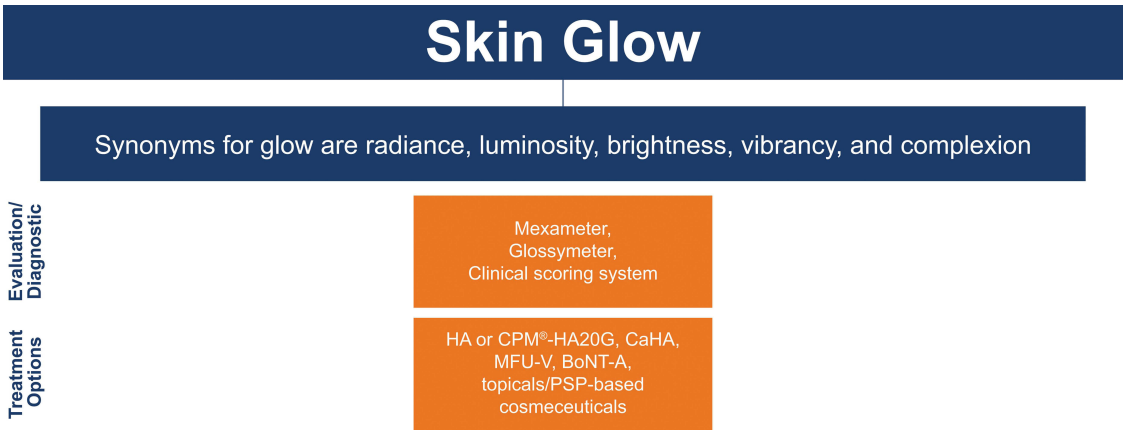

Figure 5 Skin glow measurement methods and treatment options.
Abbreviations: BoNT-A, botulinum toxin type A; CaHA, calcium hydroxylapatite; CPM®-HA20G, cohesive polydensified matrix-hyaluronic acid + glycerol; HA, hyaluronic acid; MFU-V, microfocused ultrasound with visualization.

scattered reflection with texture improvement rather than depigmentation. [20]

Thinking Beyond the Skin

The EPCs can be affected by multiple tissue layers, so it's important to note that surface appearance and quality can stem from and be impacted by deep structures or tissues (Table 1). This means that topical approaches targeting the surface skin level may not be sufficient. Instead, improving skin quality EPCs can require a holistic, multilayer treatment strategy, and deep tissue supporting treatments can affect skin surface.

Treatment Options

To aid clinicians in the development of a treatment strategy, Table 2 provides treatment options for each EPC.

Discussion

The main outcomes of the advisory board were a strong consensus that good skin quality is defined as skin that is healthy, undamaged, youthful in appearance and that skin quality can be described using the four EPCs. To our knowledge, this is the first comprehensive assessment of skin quality in aesthetic practice. This consensus definition forms the foundation of a universal understanding of skin quality. Further work is needed to develop tailored treatment algorithms based on the EPCs that incorporate gender and different ethnicities and ages; however, the EPCs and associated measurement and treatment options presented here can help guide clinicians in their daily practice to establish when aesthetic treatment is appropriate and which treatment modality can be used to ensure optimal results. The measurement options can be incorporated during patient consultation to establish a plan for treatment. Using this paradigm, clinicians can determine the EPC in which a patient has the most predominant treatment need and select a treatment from the options listed (Figures 2–5). In addition, patients can be educated about the EPCs to help them make informed decisions about the EPC they would most like to address (eg, skin tone evenness). The clinician can in turn determine the appropriate treatment option(s) and the tissue or skin layer(s) to address.

Skin quality as defined by the four EPCs also plays a critical role in patients' decision to seek treatment. There was strong consensus that skin quality influences self-esteem and perception of attractiveness and age, which in turn influences patients' desire for aesthetic treatments. For example, there was strong consensus that patients are mainly concerned about what is relevant for good skin quality in their age group, and a balance of the EPCs is beneficial to be perceived as younger and attractive.

EPC quality can be affected by multiple tissue layers. This implies that topical treatments might not be adequate to improve target parameters. The preferred approach to improve EPC quality is a multilayer treatment strategy. It's important to note that this may require deep tissue supporting treatments.

The panel was unable to reach a consensus on the proposed definition of skin coloration (comprises redness, telangiectasias, erythema, melanin). Some members considered the term to be ambiguous, while some objected to the inclusion of telangiectasias because they regarded that term to be more descriptive of redness. Others considered coloration to comprise both melanin and vascular disorders.

This consensus is not intended to be a systematic review but the core treatment options recommended by the consensus advisory board are supported both by their clinical experience and research that demonstrates the therapies improve the target EPC or parameter. The treatments can be used in combination to target multiple issues and achieve a multilayer treatment strategy. The

Table 1 Examples of Multilayer Origins of Emergent Perceptual Skin Quality Categories

Tissue Origin	Cellular Changes	Skin Appearance Effect	EPC Affected
Epidermis	Slower cell turnover	Skin roughness/texture	Surface evenness
Epidermis	Cellular adhesion/compromise Disease/age/hormones	Increased trans epidermal water loss	Firmness
Epidermis	Increased melanin	Uneven tone	Tone evenness
Dermis	Decreased HA	Dryness/loss of skin turgor	Firmness
Dermis	Elastin fragmentation	Laxity/crepiness	Firmness

Table 2 Treatment Options for Each Emergent Perceptual Skin Quality Category

	Skin Firmness	Skin Glow	Skin Tone Evenness	Skin Surface Evenness
IncobotulinumtoxinA		✓		✓
CaHA	✓	✓	✓*	✓
CPM®-HA	✓†ǂ¥	✓¥	✓¥	✓†ǂ
MFU-V	✓	✓*		✓
Topicals (eg, NEOCUTIS®)	✓	✓	✓	✓
Lasers	✓		✓	✓
Microneedling	✓	✓	✓	✓
Peelings	✓	✓	✓	✓

Notes: *Indirectly effective. †CPM®-HA 25.5 Mg. ǂCPM®-HA 26 Mg.¥CPM®-HA20G.
Abbreviations: CaHA, calcium hydroxylapatite; CPM®-HA, cohesive polydensified matrix-hyaluronic acid; HA, hyaluronic acid; MFU-V, microfocused ultrasound with visualization.

following details their mechanism of action, their advantages and proven uses, and the recommended target EPCs.

BoNT-A

BoNT-A's primary mechanism of action is inhibition of acetylcholine release, which leads to muscle paralysis.[76] Intramuscular injections of BoNT-A reduce wrinkles that are due to muscle contraction. Intradermal injections can decrease sebum production possibly by acetylcholine inhibition and improve skin laxity and enlarged facial pores possibly by inhibiting contraction of arrector pili muscles.[40]

IncobotulinumtoxinA (INCO; Xeomin®/Bocouture®, Merz Pharmaceuticals GmbH, Germany) may have advantages over other botulinum toxin formulations for improving skin quality because it is made by a unique two-step chromatographic purification process that yields only the pure 150 kDa active neurotoxin without unnecessary bacterial proteins and/or denatured BoNT protein, which may initiate an immune response and the production of neutralizing antibodies that can be associated with decreased effect over time or treatment non-response.[40] Further studies are needed to support this hypothesis. Compared with other BoNT-A formulations (onabotulinumtoxin, abobotulinumtoxin, prabotulinumtoxinA, and letibotulinumtoxin A), INCO was the only one that shortened fibroblasts at all dilutions (ranging from 1:1 to 1:10), indicating it could induce near-immediate lifting effects with no apparent cytotoxic effect.[77] The low potential for induction of immunogenicity of INCO makes it an ideal choice for intradermal injections, which may be more immunogenic than intramuscular because of the larger number of dendritic cells in the dermis that could facilitate antigen presentation, and evolving aesthetic procedures that require larger amounts of BoNT-A.[40] Intradermal microdroplet injection of INCO was recently shown to improve facial laxity, sebum production, and pore count for up to 12 weeks after injection.[40] There was consensus that BoNT-A is also useful for improving glow and acne scars.

CaHA

CaHA can be used to immediately restore volume and contours and stimulate fibroblasts to produce collagen and elastin, allowing the skin's natural processes to result in renewed skin structure and ongoing lift and contouring. CaHA has been increasingly used in a diluted or hyperdiluted form as a biostimulatory agent rather than a volumizing filler to improve skin quality and firmness for both the face and body.[78] This makes CaHA a versatile biostimulator that can improve parameters across the EPCs, including wrinkles, elasticity, tightness, pores, crepiness, scars, pigmentation, erythema, coloration, and glow.

Hyaluronic Acid Fillers

HA can revitalize skin texture by increasing dermal hydration and production of collagen and elastin.[79–82] CPM®-HA formulations (Belotero®, Merz Pharmaceuticals GmbH, Frankfurt, Germany) have also been shown to rejuvenate skin and are beneficial for enhancing all of the EPCs. In subjects with signs of facial skin aging, CPM®-HA20G, safely improved skin elasticity, firmness, tone, glow, and hydration.[20] There was consensus that the CPM®-HA range of products can also improve tightness, enlarged pores, undereye pigmentation, skin tone evenness, coloration, and glow.

MFU-V

MFU-V is the only US Food and Drug Administration-cleared device for noninvasive lifting and tightening of the skin on the neck and brow, and under the chin and improvement in the appearance of lines and wrinkles on the décolleté.[23] Previous consensus recommendations agreed that MFU-V can be incorporated as part of combination therapy to safely and effectively treat the aging face.[3] The benefits of MFU-V include that it delivers ultrasound energy at precise, predefined depths with real-time visualization to target specific foundational tissues and trigger the natural healing process to result in gradual collagen and elastin production[83,84] and that it induces thermal coagulation points of 65°C without damaging the epidermal surface and preserves the skin's integrity.[85] This makes MFU-V an effective treatment option for improving multiple EPCs and associated parameters, including glow, surface evenness, pore size, crepiness, elasticity, and tautness.

Lasers

Lasers are a necessary component of a comprehensive approach for improving skin quality. These devices primarily enhance skin surface evenness by addressing several parameters, including enlarged pores, wrinkles, unwanted hair, scars, and hyperpigmentation. Depending on the target EPC or parameter, certain lasers are preferred. CO_2 lasers can reduce wrinkles[86] and fractional lasers reduce acne scars.[87] Several types of lasers are effective for hair removal[88] and improving hyperpigmentation.[89]

Topicals

Lifestyle choices and topicals can serve as a preventative to maintain skin quality and a first-line option for improving skin quality.[90] The consensus panel unanimously agreed that patients should be encouraged to adjust their lifestyle choices as appropriate and use topicals as necessary. As noted previously, lifestyle choices that can improve EPCs include limiting sun exposure and routine use of ultraviolet protection sunscreen and moisturizers. Beneficial topicals include PSP-based cosmeceuticals that contain growth factors, cytokines, and peptides that stimulate production of collagen, elastin, and hyaluronic acid and help rejuvenate skin.[91] Daily application of PSP-based cosmeceuticals reduces facial wrinkles, roughness, and pores and improves skin firmness and elasticity.[91,92]

Conclusion

This global, multinational advisory board established strong consensus that skin quality is defined by the four EPCs—firmness, surface evenness, tone evenness, and glow—and associated parameters. The four EPCs can help clinicians determine the appropriate treatment option-(s) and the tissue layer(s) to address. Good skin quality is important to human health, social and emotional well-being, and patients' perception of attractiveness and need for aesthetic treatment.

Dedication

The authors dedicate this paper to the memory of Dr. Torsten Walker who unexpectedly passed away in 2020. In addition to being our dear friend and colleague, Dr. Walker made important contributions to the aesthetic community.

Acknowledgments

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Author Contributions

Dr. Goldie focused on the categorization and creation of the four EPC definitions and the multilayer approach and treatment options for each EPC parameter. Dr. Kerscher focused on the measurements for each EPC parameter, the overall definition and the definition for each parameter. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Dr. Kate Goldie reports personal fees from Merz Aesthetics, during the conduct of the advisory board. Dr. Martina Kerscher reports grants from Merz Pharmaceuticals, served in the advisory board member and speaker bureau for Galderma/Qmed, outside the submitted work. Drs. Martina Kerscher and Kate Goldie served as co-chairs of the advisory board for Merz. Dr. Sabrina Guillen Fabi reports grants for supporting the advisory board from Merz, during the conduct of the study; received grants as speaker's bureau investigator from Allergan, Galderma, Revance, and Merz, outside the submitted work. Dr. Cyro Hirano reports personal fees from Merz, during the conduct of the study. Dr. Heather Woolery-Lloyd reports personal fees from Merz, during the conduct of the advisory board. The authors report no other conflicts of interest in this work.

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